SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: IDAHO POLE COMPANY (Bozeman, MO)
PHASE I/PHASE II ANALYSIS

TECHNOLOGY	FS NAME	TECHNOLOGY RETAINED Phase I/Phase II	COST	EFFECTIVENESS	IMPLEMENTABILITY	COMMENTS
Institutional Actions						
Restrictions	Land Use Restrictions, Fencing	Y				
Capping						
Asphalt/Concrete Cap		N				
Multi-Layer Cover System	Clay/Soil, RCRA-Type Cap[1]	Y				
Fixation						
Solidification	Pozzolan/ Cement	N[2]		Organics may interfere with effectiveness		
Stabilization	Polymerization	N		Not effective for chlorinated organic carbons (COCs) at concentrations at site		

[1] Note that the detailed analysis in some cases discusses capping generically, including revegetation and asphalt/concrete options, but in the end only specifically mentions the RCRA-type cap.

[2] Not specifically screened out, but does not show up as an alternative at the detailed stage.

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: IDAHO POLE COMPANY (Bozeman, MO)
PHASE I/PHASE II ANALYSIS (Continued)

TECHNOLOGY	FS NAME	TECHNOLOGY RETAINED Phase I/Phase II	COST	EFFECTIVENESS	IMPLEMENTABILITY	COMMENTS
On-Site Containment						
Closure-In-Place/On-Site Encapsulation	Encapsulation, *In Situ* Polymerization	N		Not effective for COCs at concentrations at site		
Long-term On-Site Landfill	RCRA/Solid Waste Landfills	N		Long-term risk minimized, but not eliminated	Waste would need to be pre-treated due to regulations	Screened out as a primary remedial option; still considered as a treatment train component
Thermal Treatment						
On-Site Incineration	Rotary Kiln, Fluidized Bed	Y				
Off-Site Incineration	Rotary Kiln, Fluidized Bed	Y				
Pyrolysis	Pyrolytic Incineration	N		Not effective for COCs		
Vitrification	Vitrification (*In Situ*)	N		Not effective due to shallow ground water	Not effective due to shallow ground water	
	Plasma Fusion (*Ex Situ*)					

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: IDAHO POLE COMPANY (Bozeman, MO)
PHASE I/PHASE II ANALYSIS (Continued)

TECHNOLOGY	FS NAME	TECHNOLOGY RETAINED Phase I/Phase II	COST	EFFECTIVENESS	IMPLEMENTABILITY	COMMENTS
SHIRCO Infrared	Infrared Thermal Treatment	N[3]				
Biological Treatments						
In Situ Bioremediation	Bioremediation (*In Situ*)	N		Not effective on high concentrations of contaminants/LNAPL plume	Hydrogeological constraints	Screened out as a primary remedial option; still considered as a treatment train component
Ex situ Bioremediation	Solid Phase *Ex Situ* Bioremediation Treatment (with or without white rot fungus or composting)	Y				
Soil/Slurry Bioreactor	Slurry Phase Ex Situ Bioremediation Treatment	Y				

[3] Not specifically screened out, but does not show up as an alternative at the detailed stage.

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: IDAHO POLE COMPANY (Bozeman, MO)
PHASE I/PHASE II ANALYSIS (Continued)

TECHNOLOGY	FS NAME	TECHNOLOGY RETAINED Phase I/Phase II	COST	EFFECTIVENESS	IMPLEMENTABILITY	COMMENTS
Chemical Treatments						
Dechlorination	Dechlorination	N	High costs	PAHs will remain after treatment; during treatment, highly-chlorinated dioxins may be converted to more toxic, less chlorinated dioxins		
Solvent extraction	Supercritical Solvent Extraction	Y				
Physical Treatments						
Soil Flushing	Soil Flushing	Y				
Soil Washing	Soil Washing (with steam/ hot water)	Y				Treatment train secondary component
Aeration/soil venting	Vacuum Soil Venting	N		Not effective for COCs		
Off-Site Options						
Off-Site RCRA Facility	RCRA Landfill	Y				

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: IDAHO POLE COMPANY (Bozeman, MO)
PHASE I/PHASE II ANALYSIS (Continued)

TECHNOLOGY	FS NAME	TECHNOLOGY RETAINED Phase I/Phase II	COST	EFFECTIVENESS	IMPLEMENTABILITY	COMMENTS
Off-Site Sanitary Landfill	Solid Waste Landfill	Y				

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: IDAHO POLE COMPANY (Bozeman, MO)
PHASE III ANALYSIS

TECHNOLOGIES EVALUATED	SELECTED (Y/N)	OVERALL PROTECTION	COMPLIANCE WITH FEDERAL ARARS	REDUCTION OF TOXICITY, MOBILITY, OR VOLUME	LONG-TERM EFFECTIVENESS	SHORT-TERM EFFECTIVENESS	IMPLEMENTABILITY	COST
Institutional Actions								
Restrictions	Y							
Capping								
Multi-Layer Cover System	N	Interim, non-permanent remedy		No reduction of volume or toxicity				
Thermal Treatment								
On-Site Incineration	N	Production of dioxins if not maintained properly					Public opposition	High cost
Off-Site Incineration	N					Risks involved in hauling wastes 1,800 miles to site		High cost
Biological Treatment								
Ex situ Bioremediation	Y							
Soil/Slurry Bioreactor	N			Contaminant concentrations in silty/clay underflow (from soil washing step) may reduce effectiveness			Potential problems processing woody debris	More costly than LTUs

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: IDAHO POLE COMPANY (Bozeman, MO)
PHASE III ANALYSIS (Continued)

TECHNOLOGIES EVALUATED	SELECTED (Y/N)	OVERALL PROTECTION	COMPLIANCE WITH FEDERAL ARARS	REDUCTION OF TOXICITY, MOBILITY, OR VOLUME	LONG-TERM EFFECTIVENESS	SHORT-TERM EFFECTIVENESS	IMPLEMENTABILITY	COST
Chemical Treatment								
Solvent extraction	N			Overall waste volume may increase due to effluent production				High cost
Physical Treatment								
Soil Flushing	N	Might cause spreading of LNAPL			Uncertain long-term effectiveness		Soil heterogeneities and low hydraulic conductivity might limit efficiency; uncertain technical difficulties due to innovative status	
Soil Washing	Y							
Off-Site Options								
Off-Site RCRA Facility	N[4]							
Off-Site Sanitary Landfill	N[1]							

[4] No reasons for final screen out given. Eliminated as components of treatment trains that were not selected.

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: IDAHO POLE COMPANY (Bozeman, MO)
PHASE III ANALYSIS (Continued)

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: KOPPERS (Morrisville, NC)
PHASE I/PHASE II ANALYSIS

TECHNOLOGY	FS NAME	TECHNOLOGY RETAINED Phase I/Phase II	COST	EFFECTIVENESS	IMPLEMENTABILITY	COMMENTS
Institutional Actions						
Restrictions	Access/deed Restrictions; Ground Water Monitoring	N		Won't satisfy remedial objectives		
Capping						
Soil/Bentonite/Clay	Surface Cover	Y				
Multi-Layer Cover System	Surface Capping	Y				
Fixation						
Solidification	*Ex Situ* S/S	N		Not effective for dioxins		
Stabilization	Chemical Fixation (*In Situ*)	N			Non-conducive site conditions (impermeable soils, shallow depth to ground water)	
On-Site Containment						
Temporary On-Site Storage Pile	On-Site Soil Isolation	Y				
Long-Term On-Site Landfill	On-Site Landfill	Y				

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: KOPPERS (Morrisville, NC)
PHASE I/PHASE II ANALYSIS (Continued)

TECHNOLOGY	FS NAME	TECHNOLOGY RETAINED Phase I/Phase II	COST	EFFECTIVENESS	IMPLEMENTABILITY	COMMENTS
Thermal Treatment						
On-Site Incineration	On-Site Incineration	Y				
Off-Site Incineration	Off-Site Incineration	Y				
Vitrification	*In Situ* Vitrification and Plasma Reactor	N		Not proven	Non-conducive site conditions (impermeable soils, shallow depth to ground water)	
Thermal Desorption	Thermal Desorption	N		Not proven effective against dioxins	Requires post treatment of off gases	
Biological Treatment						
In situ Bioremediation	Subsurface Bioreclamation/ Composting	N		Not proven effective against dioxins	Non-conducive site conditions (impermeable soils, shallow depth to ground water)	
Ex situ Bioremediation	Engineered Land Treatment	N		Not proven effective against dioxins		
Soil/Slurry Bioreactor	Bioslurry Reactor	N		Not proven effective against dioxins		
Chemical Treatment						
Dechlorination	Dechlorination	Y				

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: KOPPERS (Morrisville, NC)
PHASE I/PHASE II ANALYSIS (Continued)

TECHNOLOGY	FS NAME	TECHNOLOGY RETAINED Phase I/Phase II	COST	EFFECTIVENESS	IMPLEMENTABILITY	COMMENTS
Solvent extraction	Solvent Extraction	N			Only applicable for oil removal from sludges/soils	
Physical Treatment						
Soil flushing	Soil Flushing	N			High clay/silt content not conducive	
Soil Washing	Soil Washing	N				No reason
Aeration/Soil Venting	Soil Vapor Extraction	N		Only effective for VOCs, which are not a problem at this site		
Other	Continuous Evaporation	N		New technology -- unproven	New technology -- unproven	
Off-Site Options						
Off-Site RCRA Facility	Off-Site Landfill	Y				

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: KOPPERS (Morrisville, NC)
PHASE I/PHASE II ANALYSIS (Continued)

TECHNOLOGY	FS NAME	TECHNOLOGY RETAINED Phase I/Phase II	COST	EFFECTIVENESS	IMPLEMENTABILITY	COMMENTS
Off-Site Recycle/Reuse Facility	Recycle Recovered Product	N		No useable product would be recovered		

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: KOPPERS (Morrisville, NC)
PHASE I/PHASE II ANALYSIS (Continued)

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: KOPPERS (Morrisville, NC)
PHASE III ANALYSIS

TECHNOLOGIES EVALUATED	SELECTED (Y/N)	OVERALL PROTECTION	COMPLIANCE WITH FEDERAL ARARS	REDUCTION OF TOXICITY, MOBILITY, OR VOLUME	LONG-TERM EFFECTIVENESS	SHORT-TERM EFFECTIVENESS	IMPLEMENTABILITY	COST
Capping								
Soil/Bentonite/Clay	N	Lowest overall protection	Potential issues with LDRs	M reduced, but not T and V	Only effective as cap remain intact			
Multi-Layer Cover System	N	Lowest overall protection	Potential issues with LDRs	M reduced, but not T and V	Only effective as cap remain intact		Long-term maintenance and ground-water monitoring required	
On-Site Containment								
Temporary On-Site Storage Pile	N	Less overall protection		M reduced, but not T and V				Unknown future treatment costs
Long-Term On-Site Landfill	N	Less overall protection	Potential issues with LDRs	M reduced, but not T and V			Disposal issues	High cost, especially operation and maint-enance

TECHNOLOGIES EVALUATED	SELECTED (Y/N)	OVERALL PROTECTION	COMPLIANCE WITH FEDERAL ARARS	REDUCTION OF TOXICITY, MOBILITY, OR VOLUME	LONG-TERM EFFECTIVENESS	SHORT-TERM EFFECTIVENESS	IMPLEMENTABILITY	COST
Thermal Treatment								
On-Site Incineration	N						Requires test burn; completion of treatment takes longest time; community opposition	
Off-Site Incineration	Y							
Chemical Treatment								
Dechlorination	Y[5] (Retained secondary option)						Requires pilot studies; completion of treatment takes longest time; most costly	
Off-Site Options								
Off-Site RCRA Facility	N	Contaminants are not destroyed	Potential issues with LDRs				Future LDRs may cause disposal problems	

[5] Retained secondary option; requires pilot studies; longest to complete; most costly.

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: LIBBY GROUND WATER (Lincoln County, MT)
PHASE I/PHASE II ANALYSIS

Comments: Key contaminants include VOCs and organics (PAHs).

TECHNOLOGY	FS NAME	TECHNOLOGY RETAINED Phase I/Phase II	COST	EFFECTIVENESS	IMPLEMENTABILITY	COMMENTS
Institutional Actions						
Restrictions		Y				
Capping						
Multi-Layer Cover System		Y				
Fixation						
Solidification		N		Limited applicability to organics; elevated pH has shown to increase mobility of some compounds such as pentachlorophenol		
On-Site Containment						
Temporary On-Site Storage Pile	Interim Storage	Y				
Long-Term On-Site Landfill		Y				
Thermal Treatment						
Infrared Treatment	SHIRCO Infrared	N	Higher than other thermal incineration technologies considered			
On-Site Incineration		Y				
Off-Site Incineration		N				

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: LIBBY GROUND WATER (Lincoln County, MT)
PHASE I/PHASE II ANALYSIS (Continued)

TECHNOLOGY	FS NAME	TECHNOLOGY RETAINED Phase I/Phase II	COST	EFFECTIVENESS	IMPLEMENTABILITY	COMMENTS
Biological Treatment						
In Situ Bioremediation						
Ex Situ Bioremediation						
Soil/Slurry Bioreactor						
Chemical Treatment						
Dechlorination		N		Creates a hazardous waste stream; will not treat PAH compounds	Scale-up for site remediation still has to be tested	
Physical Treatment						
Soil Washing		N		More effective for metals; generates secondary liquid waste when used for organics		
Off-Site Options						
Off-Site RCRA Facility		Y				

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: LIBBY GROUND WATER (Lincoln County, MT)
PHASE III ANALYSIS

Comments: Key contaminants include VOCs, organics (PAHs), and oil.

TECHNOLOGIES EVALUATED	SELECTED (Y/N)	OVERALL PROTECTION	COMPLIANCE WITH FEDERAL ARARS	REDUCTION OF TOXICITY, MOBILITY, OR VOLUME	LONG-TERM EFFECTIVENESS	SHORT-TERM EFFECTIVENESS	IMPLEMENTABILITY	COST
Institutional Actions								
Restrictions	Y							
Capping								
Multi-Layer Cover System	Y							
On-Site Containment								
Temporary On-Site Storage Pile	Y							
Long-Term On-Site Landfill	N (no specific reason provided - not selected in conjunction with other technologies)							
Thermal Treatment								
On-Site Incineration	N			No reduction in mobility of contaminants		May cause air pollution problems	Requires extensive demonstration of combustion efficiencies	High costs

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: LIBBY GROUND WATER (Lincoln County, MT)
PHASE III ANALYSIS (Continued)

TECHNOLOGIES EVALUATED	SELECTED (Y/N)	OVERALL PROTECTION	COMPLIANCE WITH FEDERAL ARARS	REDUCTION OF TOXICITY, MOBILITY, OR VOLUME	LONG-TERM EFFECTIVENESS	SHORT-TERM EFFECTIVENESS	IMPLEMENTABILITY	COST
Biological Treatment								
In Situ Bioremediation	Y							
Ex Situ Bioremediation	Y							Lowest cost
Soil/Slurry Bioreactor	Y							
Off-Site Options								
Off-Site RCRA Facility	N						Preference for on-site treatment	

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: LOUISIANA-PACIFIC (Butte County, CA)
PHASE I/PHASE II ANALYSIS

Comments: Key contaminants include VOCs (toluene), other organics (formaldehyde), and metals (arsenic, lead, zinc) The ROD documents an interim remedy and the need to collect additional data on arsenic and formaldehyde levels on and near the site. An interim remedial action eliminates the potential for exposure to site contaminants.

TECHNOLOGY	FS NAME	TECHNOLOGY RETAINED Phase I/Phase II	COST	EFFECTIVENESS	IMPLEMENTABILITY	COMMENTS
Institutional Actions						
Restrictions	Deed Well Permit Site Access	Y				
Capping						
Unspecified	Gravel/Ballast	Y				Retained as technology for soil remediation
Asphalt pavement		N	Medium capital costs; medium operation and maintenance costs		Not implementable in log deck areas	Retained as part of ground-water remediation plan
Soil/Clay/Bentonite		N	Very high operation and maintenance costs		Not implementable in traffic areas	Retained as part of ground-water remediation plan

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: LOUISIANA-PACIFIC (Butte County, CA)
PHASE I/PHASE II ANALYSIS (Continued)

TECHNOLOGY	FS NAME	TECHNOLOGY RETAINED Phase I/Phase II	COST	EFFECTIVENESS	IMPLEMENTABILITY	COMMENTS
Multi-Layer Cover System	Synthetic Membrane	Y				Selected for further consideration for the log deck pond; retained as part of ground-water remediation plan
Fixation						
Solidification	*Ex Situ* with Redisposal	N	Even though costs are not as high as soil washing, fixation may incur operation and maintenance costs for the application of surface sealants, because the long term effectiveness and permanence of contaminant mobility reduction is less certain	Long-term protectiveness is less certain than soil washing; with time and the stresses of log deck operation, the fixated mass will erode and may release particulate arsenic		

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: LOUISIANA-PACIFIC (Butte County, CA)
PHASE I/PHASE II ANALYSIS (Continued)

TECHNOLOGY	FS NAME	TECHNOLOGY RETAINED Phase I/Phase II	COST	EFFECTIVENESS	IMPLEMENTABILITY	COMMENTS
On-Site Containment						
Long-Term On-Site Landfill		N		Removal would expose contaminated subsoil; not needed in conjunction with soil washing because this treatment is permanent		
Physical Treatment						
Soil Flushing		N	Higher costs than capping	Less effective than capping because of the depth of contaminated soil		
Soil Washing		N	High capital costs			
Off-Site Options						
Off-Site RCRA Facility		N		The subsoil that would be left exposed in the excavation contains equal or even greater arsenic concentrations than the excavated soil		

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: LOUISIANA-PACIFIC (Butte County, CA)
PHASE III ANALYSIS

Comments: Key contaminants include VOCs (toluene), other organics (formaldehyde), and metals (arsenic, lead, zinc). Technologies under final consideration were institutional controls and capping.

TECHNOLOGIES EVALUATED	SELECTED (Y/N)	OVERALL PROTECTION	COMPLIANCE WITH FEDERAL ARARS	REDUCTION OF TOXICITY, MOBILITY, OR VOLUME	LONG-TERM EFFECTIVENESS	SHORT-TERM EFFECTIVENESS	IMPLEMENTABILITY	COST
Institutional Actions								
Restrictions	Y							
Capping								
Unspecified	N			No reduction in toxicity, mobility, or volume			Interrupts continuing on-site operations	Higher costs than insti-tutional actions
Multi-Layer Cover System	N			No reduction in toxicity, mobility, or volume			Interrupts continuing on-site operations	Higher costs than insti-tutional actions

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: MACGILLIS & GIBBS/BELL LUMBER & POLE (Ramsey County, MN)
PHASE I/PHASE II ANALYSIS

Comments: Key contaminants include organics (dioxins, PAHs, PCP) and metals (chromium, arsenic). High cost and transportation (incineration, dechlorination) are reasons for screening out. The retained technologies focus on the waste PCP material in abandoned process tanks in the PCP process area and the LNAPL plume in the underlying aquifer. The FS does not address soil remediation.

TECHNOLOGY	FS NAME	TECHNOLOGY RETAINED Phase I/Phase II	COST	EFFECTIVENESS	IMPLEMENTABILITY	COMMENTS
Institutional Actions						
Restrictions	Access	Y				
On-Site Containment						
Closure-In-Place/On-Site Encapsulation		Y				
Temporary On-Site Storage Pile	Oil and Sludge Extracted from LNAPL Plume	Y				For subsequent treatment and/or disposal
Thermal Treatment						
On-site Incineration		N	High costs		Requires installation of or	
Off-Site Incineration		N	High costs		Requires transportation; risks are associated with transportation	

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: MACGILLIS & GIBBS/BELL LUMBER & POLE (Ramsey County, MN)
PHASE I/PHASE II ANALYSIS (Continued)

TECHNOLOGY	FS NAME	TECHNOLOGY RETAINED Phase I/Phase II	COST	EFFECTIVENESS	IMPLEMENTABILITY	COMMENTS
Chemical Treatment						
Dechlorination	KPEG or APEG	N	High costs	The process is currently in the development stages	Requires installation of on-site dechlorination equipment or transportation to existing permitted dechlorination facility	
Off-Site Options						
Off-Site RCRA Facility		Y				

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: MACGILLIS & GIBBS/BELL LUMBER & POLE (Ramsey, MN)
PHASE III ANALYSIS

Comments: Key contaminants include organics (dioxins, PAHs, PCP) and metals (arsenic, chromium). The primary treatment method for wastewater and extracted ground water employs a fixed-film aerobic bioreactor. The rate of ground water extraction must be sufficient to enhance LNAPL extraction but should be minimized to the extent possible to control impacts on soil contamination.

TECHNOLOGIES EVALUATED	SELECTED (Y/N)	OVERALL PROTECTION	COMPLIANCE WITH FEDERAL ARARS	REDUCTION OF TOXICITY, MOBILITY, OR VOLUME	LONG-TERM EFFECTIVENESS	SHORT-TERM EFFECTIVENESS	IMPLEMENTABILITY	COST
Institutional Actions								
Restrictions	Y							
On-Site Containment								
Closure-In-Place/On-Site Encapsulation	Y							
Temporary On-Site Storage Pile	Y							
Off-Site Options								
Off-Site RCRA Facility	Y							

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: MID-ATLANTIC WOOD PRESERVERS SITE (Anne Arundel County, MD)
PHASE I/PHASE II ANALYSIS

Comments: Key contaminants include chromium, copper, and arsenic. Criteria employed in the initial phase screening process are as follows: compatibility with waste characteristics, compatibility with site characteristics, protection of public health and environment, development status, and cost.

TECHNOLOGY	FS NAME	TECHNOLOGY RETAINED Phase I/Phase II	COST	EFFECTIVENESS	IMPLEMENTABILITY	COMMENTS
Institutional Actions						
Restrictions	Deed Restrictions Monitoring (ground water, sediment, surface water, and air)	Y				
Capping						
Unspecified	Gravelling	Y				
Asphalt/Concrete	Paving	Y				
Soil/Bentonite/Clay	Clay or Synthetic	Y				
Fixation						
Stabilization	Stabilization of "Hot Spots"	Y				
Thermal Treatment						
On-site Incineration	(On-Site/Off-Site Not Specified)	N		Not effective for heavy metal contaminants		

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: MID-ATLANTIC WOOD PRESERVERS SITE (Anne Arundel County, MD)
PHASE I/PHASE II ANALYSIS (Continued)

TECHNOLOGY	FS NAME	TECHNOLOGY RETAINED Phase I/Phase II	COST	EFFECTIVENESS	IMPLEMENTABILITY	COMMENTS
Off-site Incineration	(On-Site/Off-Site Not Specified)	N		Not effective for heavy metal contaminants		
Vitrification		N	High costs	Not a well-proven technology	Generally unavailable	
Wet Air Oxidation		N		Not effective for heavy metal contaminants		
Biological Treatment						
In Situ Bioremediation	Landfarming, Composting	N		Not effective for heavy metal contaminants		
Off-Site Landfarming		N		Not effective for heavy metal contaminants		
Physical Treatment						
Soil Flushing	Solution Mining	N		A strong acid would probably be required to leach the heavy metal contaminants from the soil; the acid could cause additional contaminant migration and increased risk to the environment		

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: MID-ATLANTIC WOOD PRESERVERS SITE (Anne Arundel County, MD)
PHASE I/PHASE II ANALYSIS (Continued)

TECHNOLOGY	FS NAME	TECHNOLOGY RETAINED Phase I/Phase II	COST	EFFECTIVENESS	IMPLEMENTABILITY	COMMENTS
Soil Washing	Solvent Washing	N		A strong acid would probably be required to leach the heavy metal contaminants from the soil; however, because the metals are tightly absorbed to the soils, the process is unlikely to be efficient enough to reduce residual risks from soils to acceptable levels		
Off-Site Options						
Off-Site RCRA Facility		Y				
Off-Site Sanitary Landfill		N			Sanitary landfills would not accept the site soils	Maryland Department of the Environment advised against disposing of soils in a sanitary landfill

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: MID-ATLANTIC WOOD PRESERVERS (Anne Arundel County, MD)
PHASE III ANALYSIS

Comments: Key contaminants include chromium, copper, and arsenic. Alternative 3, which consists of a gravel cover in conjunction with ground-water remediation, was chosen.

TECHNOLOGIES EVALUATED	SELECTED (Y/N)	OVERALL PROTECTION	COMPLIANCE WITH FEDERAL ARARS	REDUCTION OF TOXICITY, MOBILITY, OR VOLUME	LONG-TERM EFFECTIVENESS	SHORT-TERM EFFECTIVENESS	IMPLEMENTABILITY	COST
Institutional Actions								
Restrictions	Y							
Capping								
Unspecified	N	Does not prevent the leaching of contaminants	Fails to meet the ARAR for RCRA closure		Routine maintenance required to keep adequate gravel cover; heavy equipment traffic may cause upheaval of contaminated soils; rate of gravel addition may exceed the settling rate, creating a need for future gravel removal action	Gravel on yard generates dust; requires dust masks or dust suppression with water spray for workers		
Asphalt/Concrete	Y							
Fixation								
Stabilization	Y							

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: MID-ATLANTIC WOOD PRESERVERS (Anne Arundel County, MD)
PHASE III ANALYSIS (Continued)

TECHNOLOGIES EVALUATED	SELECTED (Y/N)	OVERALL PROTECTION	COMPLIANCE WITH FEDERAL ARARS	REDUCTION OF TOXICITY, MOBILITY, OR VOLUME	LONG-TERM EFFECTIVENESS	SHORT-TERM EFFECTIVENESS	IMPLEMENTABILITY	COST
Off-Site Options								
Off-Site RCRA Facility	N		Discouraged by SARA statute	No reduction in toxicity or volume		Slight risk to community because of dust and transportation; requires dust masks or dust suppression techniques for workers	Limited number of RCRA landfills available to receive wastes	High costs
	Y (in conjunction with stabilization)							

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: MOSS AMERICA (Milwaukee, WI)
PHASE I/PHASE II ANALYSIS

Comments: Key contaminants include VOCs (benzene, toluene, xylenes), other organics (PAHs). Note additions under chemical treatments and biological treatments.

TECHNOLOGY	FS NAME	TECHNOLOGY RETAINED Phase I/Phase II	COST	EFFECTIVENESS	IMPLEMENTABILITY	COMMENTS
Institutional Actions						
Restrictions	Deed/ Ground-Water Monitoring	Y				
	Access Restrictions	N		Not effective for 5-mile stretch of river	Not implementable for 5-mile stretch of river; fencing seriously limits the aesthetic appeal	
Capping						
Asphalt/Concrete		N		Provides only marginal benefits in terms of achieving the clean-up goals for soils; oxidation, viscous deformation, and chemical compatibility all lessen the effectiveness of asphalt caps; susceptible to cracking		
Soil/Bentonite/Clay	Soil Cover	Y				Different than clay

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: MOSS AMERICA (Milwaukee, WI)
PHASE I/PHASE II ANALYSIS (Continued)

TECHNOLOGY	FS NAME	TECHNOLOGY RETAINED Phase I/Phase II	COST	EFFECTIVENESS	IMPLEMENTABILITY	COMMENTS
Multi-Layer Cover System	Synthetic Membrane	N		Provides only marginal benefits in terms of achieving the clean-up goals for soils; a large fraction of the contaminant mass is below the seasonal high water table, and the reduction in the amount of infiltration through the contaminated mass in the unsaturated zone will help little in achieving remedial action goals or affecting ground-water quality		
Fixation						
Solidification	Pollozonic agents	N		Not appropriate to organic contaminants because contaminants are not chemically bound		
Stabilization	Sorption	N		Not effective as a treatment or pretreatment mechanism		

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: MOSS AMERICA (Milwaukee, WI)
PHASE I/PHASE II ANALYSIS (Continued)

TECHNOLOGY	FS NAME	TECHNOLOGY RETAINED Phase I/Phase II	COST	EFFECTIVENESS	IMPLEMENTABILITY	COMMENTS
On-Site Containment						
Temporary On-Site Storage Pile		N				Mentioned briefly, don't know where it was screened out
Long-Term On-Site Landfill	On-Site RCRA Landfill	N				For treated sediments; mentioned briefly, but not specifically screened out
Thermal Treatment						
On-Site Incineration	Mobile Incinerator	Y				
Off-Site Incineration	Rotary Kiln	Y				
Vitrification		N		Effectiveness could be hindered by absence of sandy soil in some portions, presence of high water table, and presence of debris and wood chips	Implementation would require significant site preparation, such as lowering the water table and removing debris and wood	For sediment above the water table

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: MOSS AMERICA (Milwaukee, WI)
PHASE I/PHASE II ANALYSIS (Continued)

TECHNOLOGY	FS NAME	TECHNOLOGY RETAINED Phase I/Phase II	COST	EFFECTIVENESS	IMPLEMENTABILITY	COMMENTS
Biological Treatment						
In Situ Bioremediation		N		Effectiveness will be hampered by non-homogeneity of the soil, and low permeability of some soil	Implementability could be hindered by ARARs restricting injection of chemicals or wastewater into the ground	
Ex Situ Bioremediation		Y				
Soil/Slurry Bioreactor		Y				
Anaerobic Treatment		N		Aerobic biodegradation of PAHs is more effective than anaerobic processes		
Other	Facultative Processes (application of genetically modified microorganisms to waste to oxidize specific organic compounds)	N		Aerobic biodegradation is more effective; not as effective as the stimulation of indigenous organisms, acclimated to the environment and having a propensity to consume the contaminants of concern	Still largely experimental	

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: MOSS AMERICA (Milwaukee, WI)
PHASE I/PHASE II ANALYSIS (Continued)

TECHNOLOGY	FS NAME	TECHNOLOGY RETAINED Phase I/Phase II	COST	EFFECTIVENESS	IMPLEMENTABILITY	COMMENTS
Chemical Treatment						
Solvent Extraction	Solvent Extraction and Supercritical Fluid Extraction	N		May not achieve remediation goals; process performance cannot be reliably predicted and performance is specific to site and solvent	Requires soil to be finely ground and treated as an aqueous solution; the heterogenous character of the soil (gravel, clay, sand, debris) would make this very difficult to implement and control	
Other	Steam Stripping, Soil Vapor Extraction, and Chemical Reduction	N		Not effective for PAHs; not applicable to metals on-site	Not applicable to organic substances	
Physical Treatment						
Soil Flushing		N		Effectiveness would be hampered by non-homogeneity of the soil, and low permeability of some soil	Implementability could be hindered by ARARs restricting the injection of chemicals into the ground	
Soil Washing		Y				On-site

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: MOSS AMERICA (Milwaukee, WI)
PHASE I/PHASE II ANALYSIS (Continued)

TECHNOLOGY	FS NAME	TECHNOLOGY RETAINED Phase I/Phase II	COST	EFFECTIVENESS	IMPLEMENTABILITY	COMMENTS
Off-Site Options						
Off-Site RCRA Facility		Y				For biotreatment residues
Off-Site Sanitary Landfill		N			Obtaining a permit for this action would be impeded by the LDRs	

WOOD TREATER SITE NAME: MOSS AMERICA (Milwaukee, WI)
PHASE III ANALYSIS

Comments: Technology selected includes separation and dewatering of residues followed by redeposition on-site. In addition, oversize debris (e.g., railroad ties) will be disposed of off-site in a special waste landfill. All of the alternatives are expected to protect human health and the environment. The most significant differences are the cost, the time until implementation of the remedy is complete, and the amount of contaminated material that is treated as opposed to being contained.

TECHNOLOGIES EVALUATED	SELECTED (Y/N)	OVERALL PROTECTION	COMPLIANCE WITH FEDERAL ARARS	REDUCTION OF TOXICITY, MOBILITY, OR VOLUME	LONG-TERM EFFECTIVENESS	SHORT-TERM EFFECTIVENESS	IMPLEMENTABILITY	COST
Institutional Actions								
Restrictions	Y							
Capping								
Soil/Bentonite/Clay	Y							
Thermal Treatment								
On-Site Incineration	N					May cause a temporary decrease in air quality because of incinerator emissions; the incinerator could result in a steam plume and potential odors		High capital costs
Off-Site Incineration	N							High oper-ation and maint-eance costs

WOOD TREATER SITE NAME: MOSS AMERICA (Milwaukee, WI)
PHASE III ANALYSIS (Continued)

TECHNOLOGIES EVALUATED	SELECTED (Y/N)	OVERALL PROTECTION	COMPLIANCE WITH FEDERAL ARARS	REDUCTION OF TOXICITY, MOBILITY, OR VOLUME	LONG-TERM EFFECTIVENESS	SHORT-TERM EFFECTIVENESS	IMPLEMENTABILITY	COST
Biological Treatment								
Ex Situ Bioremediation	N					May result in odors downwind of the site; potential for worker exposure from direct contact and dust inhalation could be greatest because workers would till the soil periodically for several years; longest time required to achieve remedial action goals		
Soil/Slurry Bioreactor	Y							
Physical Treatment								
Soil Washing	Y							
Off-Site Options								
Off-Site RCRA Facility	Y							

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: NORTH CAVALCADE (Houston, TX)
PHASE I/PHASE II ANALYSIS

Comments: Key contaminants include PAHs, creosote, and PCP. Initial and detailed screening taken only from the FS.

TECHNOLOGY	FS NAME	TECHNOLOGY RETAINED Phase I/Phase II	COST	EFFECTIVENESS	IMPLEMENTABILITY	COMMENTS
Capping						
Soil/Clay/Bentonite		N			Difficulty foreseen in managing ground water flow regime; physical site constraints exist	
Fixation						
Solidification		N	Costs more than landfill	Possible interferences from oil	Future use of site restricted	
On-Site Containment						
Long-Term On-Site Landfill	On-Site RCRA Landfill	Y				
Thermal Treatment						
On-Site Incineration	Mobile Rotary Kiln Fluidized Bed	Y				
Off-Site Incineration		N	Approximately six times as much as on-site incineration, in large part because of transportation and off-site disposal costs			

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: NORTH CAVALCADE (Houston, TX)
PHASE I/PHASE II ANALYSIS (Continued)

TECHNOLOGY	FS NAME	TECHNOLOGY RETAINED Phase I/Phase II	COST	EFFECTIVENESS	IMPLEMENTABILITY	COMMENTS
Biological Treatment						
In Situ Bioremediation		Y				
Physical Treatment						
Soil Flushing		Y				
Soil Washing		N			Requires extensive equipment; requires vapor recovery and treatment as well as solvent recovery and treatment of washing fluid	
Off-Site Options						
Off-Site RCRA Facility		N	Higher cost than on-site RCRA landfill		Uncertainty about the availability of a disposal facility able to accept CERCLA wastes at the time of remediation	

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: NORTH CAVALCADE (Houston, TX)
PHASE III ANALYSIS

Comments: Key contaminants include PAHs, creosote, and PCP.

TECHNOLOGIES EVALUATED	SELECTED (Y/N)	OVERALL PROTECTION	COMPLIANCE WITH FEDERAL ARARS	REDUCTION OF TOXICITY, MOBILITY, OR VOLUME	LONG-TERM EFFECTIVENESS	SHORT-TERM EFFECTIVENESS	IMPLEMENTABILITY	COST
On-Site Containment								
Long-Term On-Site Landfill	N			No reduction in toxicity or volume	Not a permanent remedy because wastes remain on-site	Risk of exposure to contaminants	Site permits may be difficult to obtain	
Thermal Treatment								
On-Site Incineration	N						Utilities must be relocated; community opposes incineration	High costs
Biological Treatment								
In Situ Bioremediation	Y							
Physical Treatment								
Soil Flushing	N							An estimated $.6 million more than *in situ* bioreclamation

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: PALMETTO WOOD PRESERVING (Dixiana, SC)
PHASE I/PHASE II ANALYSIS

Comments: Key contaminants include chromium and arsenic. Soil contamination exists to an average depth of six feet. Technologies were evaluated on the basis of implementability, operability, and reliability.

TECHNOLOGY	FS NAME	TECHNOLOGY RETAINED Phase I/Phase II	COST	EFFECTIVENESS	IMPLEMENTABILITY	COMMENTS
Institutional Actions						
Restrictions		Y				
Capping						
Multi-Layer Cover System		Y				
Fixation						
Solidification		N		Ineffective for waste type; not effective in immobilizing organics; chromium VI doesn't stabilize; increases weight and volume of final product	Possible leaching of exposed products which may require secondary containment measures	
Stabilization		Y				Memo indicated that stabilization was used
On-Site Containment						
Closure-In-Place/On-Site Encapsulation		Y				

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: PALMETTO WOOD PRESERVING (Dixiana, SC)
PHASE I/PHASE II ANALYSIS (Continued)

TECHNOLOGY	FS NAME	TECHNOLOGY RETAINED Phase I/Phase II	COST	EFFECTIVENESS	IMPLEMENTABILITY	COMMENTS
Long-Term On-Site Landfill	Off-Site Excavation of Contaminated Areas with On-Site Disposal	N			Not applicable due to limited off-site contamination	
Physical Treatment						
Soil Washing		Y				
Attenuation (mixing with clean soil)		N	Contaminated area is too extensive for process		Treatment would be necessary below the maximum effective depth of two feet	
Off-Site Options						
Off-Site RCRA Facility		Y				

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: PALMETTO WOOD PRESERVING (Dixiana, SC)
PHASE III ANALYSIS

Comments: Key contaminants include chromium and arsenic. Technologies were evaluated on the basis of technical, short-term/long-term environmental/public, and institutional considerations as well as cost.

TECHNOLOGIES EVALUATED	SELECTED (Y/N)	OVERALL PROTECTION	COMPLIANCE WITH FEDERAL ARARS	REDUCTION OF TOXICITY, MOBILITY, OR VOLUME	LONG-TERM EFFECTIVENESS	SHORT-TERM EFFECTIVENESS	IMPLEMENTABILITY	COST
Institutional Actions								
Restrictions	Y							
Capping								
Multi-Layer Cover System	N	Not entirely protective when used alone		No reduction in toxicity or volume	Contaminated soil remains at the site			
Fixation								
Stabilization	Y							
On-Site Containment								
Closure-In-Place/On-Site Encapsulation	N			No reduction in toxicity or volume	Contaminated soil remains at the site		Intensive effort to excavate	
Physical Treatment								
Soil Washing	Y							
Off-Site Options								
Off-Site RCRA Facility	N				Not a permanent solution		Requires NCP analysis	High costs

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: RENTOKIL/VIRGINIA WOOD PRESERVING (Richmond, VA)
PHASE I/PHASE II ANALYSIS

Comments: Note that dechlorination was selected only if necessary for K001 wastes and off-site incineration was not chosen as a primary treatment process; instead, it was selected for the low volume wastes from possible dechlorination treatment.

TECHNOLOGY	FS NAME	TECHNOLOGY RETAINED Phase I/Phase II	COST	EFFECTIVENESS	IMPLEMENTABILITY	COMMENTS
Institutional Actions						
Restrictions	Land Use Ground-water Use Ground-water Monitoring	Y				
Capping						
Unspecified		Y				Type of cap was undecided
Fixation						
Solidification		Y				Primarily for arsenic
Stabilization		Y				Primarily for arsenic
On-Site Containment						
Temporary On-Site Storage Pile		Y				Prior to construction of the cap

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: RENTOKIL/VIRGINIA WOOD PRESERVING (Richmond, VA)
PHASE I/PHASE II ANALYSIS (Continued)

TECHNOLOGY	FS NAME	TECHNOLOGY RETAINED Phase I/Phase II	COST	EFFECTIVENESS	IMPLEMENTABILITY	COMMENTS
Long-Term On-Site Landfill		Y				Place treated soil back in the excavated area from which it was removed
Thermal Treatment						
On-Site Incineration	Rotary Kiln	Y				
Off-Site Incineration		Y				For low volume waste from dechlorination
Vitrification	Plasma Arc	N		Would not be effective in treating fine-grained soils		
Thermal Desorption		Y				
Biological Treatment						
In Situ Bioremediation		N		Not capable of treating carcinogenic PAHs to the required cleanup level at the present time		

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: RENTOKIL/VIRGINIA WOOD PRESERVING (Richmond, VA)
PHASE I/PHASE II ANALYSIS (Continued)

TECHNOLOGY	FS NAME	TECHNOLOGY RETAINED Phase I/Phase II	COST	EFFECTIVENESS	IMPLEMENTABILITY	COMMENTS
Ex Situ Bioremediation		N		Not capable of treating carcinogenic PAHs to the required cleanup level at the present time		
Soil/Slurry Bioreactor		N				
Chemical Treatment						
Dechlorination		Y				If necessary
Solvent Extraction		Y				
Other	Steam Stripping	N		The fine-grained, clay rich site soils cannot be treated effectively by steam stripping because of poor contact between steam and solid materials		

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: RENTOKIL/VIRGINIA WOOD PRESERVING (Richmond, VA)
PHASE I/PHASE II ANALYSIS (Continued)

TECHNOLOGY	FS NAME	TECHNOLOGY RETAINED Phase I/Phase II	COST	EFFECTIVENESS	IMPLEMENTABILITY	COMMENTS
Physical Treatment						
Soil Flushing		N		A solvent capable of leaching both organics and heavy metals from the soil has not been identified; low permeability of soils would make collection of any added solvent difficult		
Soil Washing		N		Not effective in treating fine-grained contaminated soils at the site		

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: RENTOKIL/VIRGINIA WOOD PRESERVING (Richmond, VA)
PHASE III ANALYSIS

TECHNOLOGIES EVALUATED	SELECTED (Y/N)	OVERALL PROTECTION	COMPLIANCE WITH FEDERAL ARARS	REDUCTION OF TOXICITY, MOBILITY, OR VOLUME	LONG-TERM EFFECTIVENESS	SHORT-TERM EFFECTIVENESS	IMPLEMENTABILITY	COST
Institutional Actions								
Restrictions	Y							
Capping								
Unspecified	Y							
Fixation								
Solidification	Y							
Stabilization	Y							
On-Site Containment								
Temporary On-Site Storage Pile	Y							
Long-Term On-Site Landfill	Y							
Thermal Treatment								
On-Site Incineration	N							High costs
Off-Site Incineration	Y							
Thermal Desorption	Y							

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: RENTOKIL/VIRGINIA WOOD PRESERVING (Richmond, VA)
PHASE III ANALYSIS (Continued)

TECHNOLOGIES EVALUATED	SELECTED (Y/N)	OVERALL PROTECTION	COMPLIANCE WITH FEDERAL ARARS	REDUCTION OF TOXICITY, MOBILITY, OR VOLUME	LONG-TERM EFFECTIVENESS	SHORT-TERM EFFECTIVENESS	IMPLEMENTABILITY	COST
Chemical Treatment								
Dechlorination	Y							
Solvent Extraction	N						Difficulties were encountered in previous attempts with this treatment process	High costs

SITE-SPECIFIC DATA COLLECTION FORM
WOOD TREATER SITE NAME: RENTOKIL/VIRGINIA WOOD PRESERVING (Richmond, VA)
PHASE III ANALYSIS (Continued)